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Herbicide Guide 1976

FOR COMMERCIAL VEGETABLE GROWERS

WEED GROWTH reduces vegetable growers' income in the United States by millions of dollars annually as a result of lower yields, poorer quality, and added labor in harvesting and processing.

This guide should be used together with the grower's knowledge of soil types and the crop and weed history of the area to be treated. Whether to use herbicides or other means of weed control depends in part on the severity of past weed infestations. In many instances mechanical control is sufficient alone or is needed in addition to herbicide use. Several herbicides may be suggested for some crops. These herbicides have shown good control with no injury to the vegetables under test conditions. Not all herbicides cleared for use on a species are necessarily listed. Where the choice of more than one herbicide is suggested, the decision rests with the grower and is based on his knowledge of past weed infestation and cost of material. Where one herbicide will not control the weeds present a combination of herbicides is suggested. When using an herbicide for the first time, use a small-scale trial.

These suggestions for chemical weed control in vegetables are based on research at the Illinois Agricultural Experiment Station, the U.S. Department of Agriculture, and other research institutions. The University

of Illinois and its agents assume no responsibility for results from the use of these herbicides, whether or not they were used in accordance with suggestions, recommendations, or directions of the manufacturer or any governmental agency.

Reading the label of the herbicide container is the most profitable time you spend in weed control. Use of the material and methods of application and use depend on registration of the herbicide by federal and state Environmental Protection Agencies (EPA). Do not use any herbicide *unless the label states that it is cleared for the use on the crop to be treated.*

Where mixtures of chemicals are applied the *user* will assume the responsibility for freedom from residues if such applications are not labeled by the EPA as a mixture.

Suggestions sometimes change during the growing season based on EPA clearances after date of issue. This circular is printed only once each year, and is therefore subject to change without notification.

Watch for notice of changes in EPA registration of herbicides (as released by the EPA) in the Illinois Vegetable Farmer's Letter. The Letter is available on request from the Department of Horticulture, University of Illinois, Urbana 61801.

NOTE: In the suggestions table on the following pages, the trade names of the herbicides are usually used. The list immediately below shows trade names and their corresponding common names.

Common name	Trade name	Common name	Trade name	Common name	Trade name
alachlor	Lasso	dalapon	Basfapon, Dowpon	naptalam	Alanap
atrazine	AAtrex and others	DCPA	Dacthal	nitrofen	TOK
benefin	Balan	dinitramine	Cobex	profluralin	Tolban
bensulide	Prefar	dinoseb	Premerge, Sinox	propachlor	Ramrod
butylate	Sutan +	diphenamid	Dymid, Enide	pyrazon	Pyramin
CDAA	Radox	diuron	Karmex	simazine	Princep
chloramben	Amiben, Vegiben 2E	EPTC	Eptam	trifluralin	Treflan
chlorbromuron	Bromex, Maloran	linuron	Lorox	Petroleum solvent	Stoddard Solvent
chlorpropham	Furloe	MCPA	Numerous	2,4-D (amine)	Numerous
cyanazine	Bladex	MCPB	Numerous		
cycloate	Ro-Neet	metribuzin	Lexone, Sencor		

USE THESE SUGGESTIONS IN 1976 ONLY

<i>Crop</i>	<i>Herbicide</i>	<i>Rate of active ingredient per acre actually covered¹</i>	<i>Weeds controlled</i>	<i>Best time of application (based on crop stage)</i>	<i>Remarks, cautions, limitations</i>
Asparagus (seedlings)	Amiben	3 lb.	Annuals	Immediately after seeding	Irrigation or rainfall after treatment will give maximum control.
Asparagus (established plantings)	dalapon	5-10 lb.	Perennial grass	End of harvest season following disking	Apply when grass weeds are 3 to 4 inches tall. Direct spray under fern growth. Use surfactant as directed on label.
	Karmex	3 lb.	Annuals	In spring before spears emerge and/or immediately following harvest	Apply after disking. Do not exceed 6 lb. per growing season. Use lighter rate on sandy soil.
	Princep	3-4 lb.	Annuals	In spring and after harvest	Apply after disking. Do not treat during last year in asparagus because of residue. With Karmex and Princep—usually weed infestation will be reduced and spring application may be sufficient after first year.
Beans, lima and dry	Amiben	2-3 lb.	Broad spectrum of annual weeds	Immediately after seeding	Field may be rotary-hoed without destroying herbicide action. Do not feed foliage to livestock.
	Treflan	0.5-0.75 lb.	Annuals ² (primarily grasses)	Preplant soil application Incorporate with soil immediately	Plant crop immediately or within 3 weeks after application. Can be used up to 1 lb. on dry beans.
Beans, snap	Eptam	3 lb.	Annual grasses and nutgrass ⁴	Preplant soil application Incorporate with soil immediately	Plant crop immediately or within 3 weeks after application.
	Treflan	0.5-0.75 lb.	Annuals ² (primarily grasses)	Preplant soil application Incorporate with soil immediately	
	Dacthal	6-10 lb.	Annuals ³ (primarily grass)	Immediately after seeding	Do not feed treated plant parts to livestock.
	Vegiben 2E (2E formulation only)	1.5-3 lb.	Broad spectrum of annual weeds	Immediately after seeding	This ester form of chloramben may leach less readily in sandy soils. Use on other than sandy soils.
Beans, dry	Cobex	0.3-0.6 lb.	Annuals	Preplant soil incorporation	TRIAL USE IN 1976.
Beans, dry, lima, and snap	Tolban	0.5-1 lb.	Primarily annual grasses	Preplant soil incorporation	TRIAL USE IN 1976.
Beets, garden	Pyramin	4 lb.	Annuals (primarily broad-leaved)	Preemergence or after beets emerge and before weeds have 2 true leaves	Where grasses are a severe problem, use 4 lb. Pyramin + 4 lb. Ro-Neet.
	Ro-Neet	4 lb.	Annual grasses	Preplant soil application Incorporate with soil immediately	Use a combination treatment with Pyramin to broaden control spectrum.
Broccoli Brussels sprouts Cabbage Cauliflower	Preemergence — direct-seeded				
	Treflan	0.5-0.75 lb.	Annuals ² (primarily grasses)	Preplant soil application Incorporate with soil immediately	Stunting or growth reduction may occur at recommended rates under growth stress conditions.
	Dacthal	6-10 lb.	Annuals ³ (primarily grasses)	Immediately after seeding	Can also be used preemergence on transplants.
	Preemergence — transplanted				
	Treflan	0.5-1 lb.	Annuals ² (primarily grass)	Preplant soil application Incorporate with soil immediately	Transplant after application to 3 weeks later.
Carrots	Postemergence — direct-seeded or transplanted				
	TOK ⁷	3-5 lb.	Broad-leaved weeds ⁸	One to 2 weeks after crop emergence or transplanting, while weeds are in seedling stage	Use wettable powder formulation to reduce injury potential. Use in combination with preplant or preemergence material for annual grass control.
	Treflan	0.5-1.0 lb.	Annuals ² (primarily grass)	Preplant soil incorporation Incorporate with soil immediately	Seed after application to 3 weeks later.
	Lorox	1-1.5 lb.	Annuals	Postemergence on carrots only after crop is 2-6 inches tall	Do not feed treated foliage to livestock or replant treated area for 4 months.
	TOK	3-5 lb.	Broad-leaved weeds ⁸	While weeds are in seedling stage	Can also be used on celery and parsley. Use in combination with preplant or preemergence material for annual grass control.
	Stoddard Solvent	60-80 gal.	Annuals	After 2 true leaves have appeared (do not apply to carrots or parsnips after they are ¼ inch diameter, since oily taste may result)	Most effective when sprayed on cloudy days or during high humidity, and when weeds are not more than 2 inches high. May not control ragweed. Do not apply within 40 days of harvest. Can also be used on celery, dill, parsnips, and parsley.

¹ Based on active ingredients (actual amount of active herbicide in material or acid equivalent). Use lower rate on sandy soil and higher rate on clay and loam soils. When using a band application over the row, adjust amount of material applied to the part of an acre treated. See Illinois Circular 1047.

² May not control ragweed and panicum. ³ May not control ragweed, smartweed, and velvetleaf. ⁴ May not control smartweed. ⁵ May not control smartweed and velvetleaf. ⁶ May not control crabgrass. ⁷ Use of 50% wettable powder is suggested for cabbage and horseradish. ⁸ May not control ragweed or chickweed. Grass control is sometimes marginal. ⁹ Do not use Alanap Plus, Solo, Whistle, or Amoco Soybean herbicide. These materials all contain Alanap plus another ingredient which may cause injury.

<i>Crop</i>	<i>Herbicide</i>	<i>Rate of active ingredient per acre actually covered¹</i>	<i>Weeds controlled</i>	<i>Best time of application (based on crop stage)</i>	<i>Remarks, cautions, limitations</i>
Corn, pop	Preemergence				
	atrazine	2-3 lb.	See sweet corn	See sweet corn	See sweet corn <i>except section on combinations</i> .
	Bladex	2.5-4 lb.	Annuals	Preemergence	May injure crop on light sandy soil. Has been shown to have less soil residue than atrazine.
	Lasso	2-2.5 lb.	See sweet corn		
	Princep	2-3 lb.	Annuals	Preemergence	Plant only crops so specified on the label the following year. Do not graze treated areas.
	Postemergence				
	2,4-D	½ lb.	Broad-leaved	Postemergence	Apply when corn is 3 to 10 inches tall.
Corn, sweet	Preemergence				
	atrazine	2-3 lb.	Annuals, annual and perennial grasses ⁴	Preemergence, apply no later than 3 weeks after seeding. Shallow cultivation may improve weed control during dry weather	Grow corn a second year without atrazine treatment. This chemical has a high soil residue. Do not plant other vegetable crops on a sprayed area until a second year of corn has been grown. Use atrazine where quackgrass is a problem. Residue hazard decreased when banded or in combination with Lasso, Ramrod or Sutan.
	Bladex	2.5-4 lb.	Annuals	Preemergence	May injure crop on light sandy soil. Has been shown to have less soil residue than atrazine.
	Lasso	2-2.5 lb.	Annuals	Preemergence	Preplant incorporation may aid control of nutgrass. Do not apply in nitrogen solutions.
	Ramrod	4-5 lb.	Annuals	Preemergence	Do <i>not</i> use on sandy soils. Is an excellent herbicide on high organic matter soils.
	Sutan +	3-4 lb.	Primarily annual grasses	Preplant soil application. Incorporate with soil	Use on sandy soil and where nutgrass is a problem.
	Preemergence combinations				
	atrazine plus Lasso	1.5 lb. + 2.0 lb.	Annuals and perennial grasses	Preemergence or preplant incorporated	See label for slightly higher rate of Lasso for preplant incorporated.
	atrazine plus Ramrod	1.5 lb. + 3 lb.	Annuals and perennial grasses	Preemergence	Use to reduce atrazine residue.
	atrazine plus Sutan +	1 lb. + 3-4 lb.	Annuals and perennial grasses	Preplant soil incorporation. Incorporate with soil immediately	Use where nutgrass is a problem and to reduce atrazine residue.
	Bladex plus Lasso	1-2 lb. + 2 lb.	Annuals	Preemergence or preplant incorporated	
	Bladex plus Sutan +	1 2 lb. + 3-4 lb.	Annuals	Preplant soil incorporation. Incorporate with soil	Use where nutgrass is a problem and to broaden annual grass control.
	Postemergence				
	2,4-D (amine)	½ lb.	Broad-leaved	Postemergence	Preferably, apply before corn is 6 inches tall. If corn is over 12 inches reduce rate to ¼ lb.
	atrazine	2 lb.	Annuals, annual and perennial grasses ⁶	Directed spray 3 weeks after emergence	Can be combined with crop oils for postemergence application as an emergency measure. This may increase residue to following year. Preemergence use preferred. Do not graze or feed treated foliage for 21 days after treatment.
Cucumbers Muskmelons Watermelons	Alanap ⁹	3-5 lb.	Annuals ⁴	Immediately after seeding or transplanting	Do not use on cold soil. Rainfall or irrigation after treatment gives maximum control.
		3-3.5 lb.		After transplanting or vining	Use granular form. Keep away from foliage. Apply to soil after weeds have been removed.
	Prefar	4-6 lb.	Annuals (primarily grasses)	Preplant soil incorporation. Incorporate with soil immediately	Is primarily a grass killer. Consult label for sensitive crops within 18 months after application. Prefar can be used in rotation with tomatoes, broccoli, cauliflower, and lettuce, carrots, onions, summer squash within 18 months of application.
	Prefar plus Alanap ⁹	4 lb. + 2-3 lb.	Grasses and broadleaves	Preplant soil incorporation for Prefar; Alanap as an immediate post seeding application.	Has value for broad spectrum weed control. Consult label for sensitive crops within 18 months after Prefar application. Has EPA approval as a tank mixture.
	Vegiben 2E (2E formulation only)	1.5-3 lb.	Broad spectrum of annual weeds	Immediately after seeding	This ester form of chloramben may leach less readily in sandy soils. Above 1.5 to 2 lb. per acre injury chances increase during moist soil conditions. Some muskmelon cultivars may be susceptible to Vegiben injury.
Eggplant	Dacthal	6-10 lb.	Annuals ¹ (primarily grass)	Immediately after transplanting	
Greens	Dacthal	6-10 lb.	Annuals ³ (primarily grasses)	Immediately after seeding	For use on collards, kale, mustard greens and turnips.
	Treflan	0.5-0.75 lb.	Annuals ² (primarily grasses)	Preplant soil application. Incorporate with soil immediately	For use on collards, kale, mustard greens and turnip greens.
	Furloe	1-2 lb.	Primarily broad-leaf annuals	Preemergence	For spinach only. Use lower rates in cool, wet weather.

(See footnotes on page 2.)

<i>Crop</i>	<i>Herbicide</i>	<i>Rate of active ingredient per acre actually covered¹</i>	<i>Weeds controlled</i>	<i>Best time of application (based on crop stage)</i>	<i>Remarks, cautions, limitations</i>
Horseradish	TOK ⁷	3-5 lb.	Broad-leaved weeds ⁸	Before weeds are 1 inch tall	Will not consistently control weeds over 1 inch tall. Some emerging annual grass may be controlled by this treatment. Lower rate will control seedling purslane.
Lettuce	Balan	1.5 lb.	Annuals	Preplant soil incorporation Incorporate with soil immediately	Is primarily a grass killer. Seed after application to 3 weeks later. Do not plant wheat, barley, rye, grass, onions, oats, beets, or spinach for 12 months after application.
Onions	Preemergence Dacthal	6-10 lb.	Annuals ⁸ (primarily grasses)	Immediately after seeding or transplanting	May not kill smartweed or common ragweed. Can be used on seeds, sets, or seedlings. Use only on mineral soils. Use lower rates on sandy soils. A double application of Dacthal can be used at seeding, layby, or both. In most situations, the weed spectrum on mineral soils will respond well to a combination of Dacthal preemergence and TOK postemergence.
	Randox	4-6 lb.	Annuals ⁸ (primarily grasses)	Just before onions emerge	Use on muck soils. Heavy rainfall may reduce stand. Very effective on purslane and pigweed.
	Postemergence TOK	3-4 lb.	Broadleaf weed control	When weeds are in seedling stage and not over 1 inch tall	Use a single application of E.C. or W.P. per growing season. Do not apply E.C. until onions are in the 2-3 leaf stage. <i>Preemergence</i> use of TOK with heavy rainfall may reduce stand. Use in combination with preplant or preemergence material for annual grass control.
	Furloe	3-6 lb.	Broadleaf control (especially smartweed)	On seeded onions: loop stage or after 3- to 4-leaf stage	In the later sprays, direct at base of onion plant. If more than one application is applied do not exceed 6 lb. per acre for the season. <i>Use lower rates in cool, wet weather.</i> Use no later than 30 days before harvest.
Peas	Ramrod	4-4.9 lb.	Annuals	Preemergence	Do <i>not</i> use on sandy soil.
	Treflan	0.5-0.75 lb.	Annuals ²	Preplant soil incorporation Incorporate with soil immediately	Seed after application to 3 weeks later. Some reduction of growth and stand reduction possible under stress.
	MCPB	1 lb.	Broad-leaved weed and Canada thistle	When peas are 3-7 inches tall and no later than 4 nodes prior to pea blossom	May delay maturity 1 to 4 days. Use at least 20 gal. of water per acre. Do not feed vines to livestock. MCPA is more effective on mustard. MCPB is less injurious to peas.
	MCPA	¼-½ lb.			
	dinoseb	0.3-9 lb.	Annuals (primarily broad-leaved)	Preemergence or postemergence	Preemergence use 6 to 9 lb. Postemergence use 0.3 to 1.1 lb. Apply prior to bloom when peas are 2 to 8 inches tall. See label for further precautions.
Potatoes, Irish	Eptam	3-6 lb.	Annual grasses and nutgrass ⁴	Drag-off treatment at emergence or preplant soil application Incorporate with soil immediately	Use lower rate on sandy soil.
	Treflan	0.5-1 lb.	Annuals ² (primarily grasses)	Drag-off treatment at emergence	Use a light incorporation.
	Lorox	1-2 lb.	Annuals	At very start of potato emergence	Plant tubers at least 2 inches deep. Do not replant treated area to other crops for 4 months after treatment. May injure crop on light sandy soil.
	chlorbromuron	2-3 lb.	Annuals	At very start of potato emergence	May injure crop on light sandy soil. Do not harvest immature potatoes. Do not plant crops other than field corn, potatoes, or soybeans for 6 months after applying.
	dalapon	7 lb.	Quackgrass	Before plowing in spring; wait 4 days before plowing and planting	Not for fields intended for red-skinned varieties or White Rose. Do not plant potatoes for 4 weeks. Use surfactant as directed on label.
	metribuzin	0.25-1 lb.	Annuals (primarily broad-leaved)	Postemergence, following a preemergence grass herbicide	Can be used preemergence also. Do not exceed 1 lb. per acre in a season. Do not apply within 60 days of harvest. Do not use on red-skinned or early-maturing white varieties. TRIAL USE IN 1976.
	Lasso	2.5-3 lb.	Annuals	Apply at drag-off	Do not use on sandy soils. TRIAL USE IN 1976 ALONE OR IN COMBINATION WITH LOROX OR DINOSEB.
Potatoes, sweet	Dacthal	6-10 lb.	Annuals ³ (primarily grasses)	Immediately after planting	May not control smartweed or common ragweed. Preferred on sandy soil.
	Amiben	3 lb.	Annuals	Immediately after planting	Preferred on loam soils. Do not feed foliage to livestock.
Spinach	Furloe	1-2 lb.	Annuals	Immediately after seeding	Use 1 lb. if the temperature is below 60°.
Squash Pumpkins	Amiben	3-4 lb.	Annuals	As soon after seeding as possible	Use on loam soils.

(See footnotes on page 2.)

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<i>Crop</i>	<i>Herbicide</i>	<i>Rate of active ingredient per acre actually covered¹</i>	<i>Weeds controlled</i>	<i>Best time of application (based on crop stage)</i>	<i>Remarks, cautions, limitations</i>
Squash	Prefar	4-6 lb.	Annuals (primarily grasses)	Preplant soil application Incorporate with soil immediately	Is primarily a grass killer. Consult label for sensitive crops within 18 months after application. Prefar can be used in rotation only with tomatoes, broccoli, cauliflower, lettuce, carrots, onions, and summer squash within 18 months of application. Use in combination with Alanap as suggested for cucumbers.
Tomatoes, direct-seeded	Dymid, Enide	4-6 lb.	Annuals	Preemergence	Do not plant other food crops on treated areas for 6 months. If used under dry soil conditions, a shallow (1 inch) incorporation as a preplant treatment may improve weed control. Can also be used on transplanted tomatoes and peppers.
Tomatoes and Peppers, transplanted	Amiben	3-4 lb.	Annuals	Wait 3 days after transplanting to apply	Use granular formulation only. Do not use on sandy soils.
	Treflan	0.5-1 lb.	Annuals ² (primarily grasses)	Preplant soil application Incorporate with soil immediately	Some reduction of growth may be possible under growth stress conditions or if rates are higher than suggested for soil type.

(See footnotes on page 2.)

Storage of Pesticides and Containers

Keep pesticides and containers in a separate building, room, or enclosure used only for this purpose. Such buildings or rooms should be dry, ventilated, and locked. Fence outside storage areas to protect children and animals and to discourage pilferage. CAUTION: Do not store weedkillers, herbicides, or defoliants in the same room with insecticides. Chlorate salts can create a fire or explosion hazard. Remove only the pesticides needed for one day's operation and return empty containers — and any unused pesticide — to the storage area each day.

Disposing of Pesticides and Containers

Disposal methods and precautions depend on the type of container and facilities available. Drain any left-over pesticide into a pit dug in sandy soil. Rinse glass and small metal containers several times with the diluent being used and include the rinse in your spray. Keep lids and bungs tightened.

Do not burn volatile weedkiller containers. Weedkillers such as 2,4-D and its derivatives can volatilize, and the resulting vapor may damage nearby plants, crops, and shrubbery. Herbicides or defoliants containing chlorates may explode when heated. *Dispose of containers in this manner:* break glass containers and chop holes in the top, bottom, and sides of metal containers so they cannot be used again or collect water; bury all weedkiller containers 18 inches deep at a safe disposal site or take them to a dump to be covered with soil.

OTHER WEED CONTROL PUBLICATIONS

Obtain the following publications on weed control from the office of your county Extension adviser (agriculture) or by writing to the Office of Agricultural Publications, 123 Mumford Hall, Urbana, Illinois 61801.

Prevent 2,4-D Injury to Crops and Ornamental Plants — Circular 808;
Legal Aspects of Crop Spraying — Circular 990;
Calibrating and Adjusting Granular Row Applicators — Circular 1008;
Calibrating and Maintaining Spray Equipment — Circular 1038;
Band Spraying Preemergence Herbicides — Circular 1047;
Controlling Weeds in the Home Garden — Circular 1051;
Turfgrass Pest Control — Circular 1076;
Herbicides for Commercial Fruit Crops in Illinois — H-659;
1976 Field Crops Weed Control Guide.

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